

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Sankar Sambasivan and Kimberly A. Steiner	)
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Application No.	10/627,194	)
Confirmation No.	2708	) Group Art Unit: 1794
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Filed:	July 24, 2003	) Examiner: Timothy M. Speer
		)
Title:	Aluminum Phosphate Compounds, Compositions,	) Attorney Docket No.:
	Materials and Related Metal Coatings	) 7125
		)

**Declaration of Vikram S. Kaul Under 37 C.F.R. §1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

I, Vikram S. Kaul, declare as follows:

1. I am currently employed by Applied Thin Films, Inc. as Materials R&D Scientist for Applied Thin Films, Inc.
2. I received a B.S. degree from Purdue University in materials engineering and a Ph.D. in materials science and engineering from Northwestern University.
3. As part of my professional capacity, I have had two years experience in materials science, research, and development.
4. A series of tests were performed under my direction and control to compare properties of metal coupons coated with aluminum/phosphorus-containing materials as described in Birchall US Patent 3,839,078 and materials described in Application No. 10/627,194. In these tests AUS 304 stainless steel coupons (double mirror finish) were used. These coupons were first cleaned by

ultrasonication for 30 minutes in a solution of deionized water and Alconox, rinsed with deionized water, and blown dry with nitrogen gas.

5. A sample of dried aluminum chlorophosphate ethanolate (ACPE) was prepared according to the teaching of Birchall US Patent 3,839,078 (col. 23, lines 52-64). A cleaned stainless steel coupon was dipped in a methanol solution of ACPE for one minute and then removed from the solution at a retraction velocity of 0.4 cm/sec, dried, and heated in an oven for thirty minutes in accordance with the teachings of Example 2 and column 4, lines 27-31 in Birchall.

6. A solution of aluminum phosphate precursor was prepared in accordance with the teachings of Application No. 10/627,194. In this preparation, a solution of aluminum nitrate was added to a solution of phosphorus pentoxide ( $Al/P=2$ ) and refluxed overnight, and then diluted with ethanol to form a 0.2M ethanol solution. A cleaned stainless steel coupon was dipped into this ethanol precursor solution for one minute, and then removed from the solution at a retraction velocity of 0.4 cm/sec. This coupon was dried using a heat gun for two minutes and heated at 500°C for five minutes, in accordance with the teaching of Application No. 10/627,194 (Example 24 and Par. 0019).

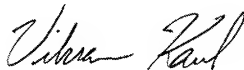
7. The coupons coated as described above and one uncoated coupon were heated in an oven in static air at 1000°C for 10 hours and then cooled to ambient conditions. Photos of these coupons after such heat treatment are shown in the attached Exhibits A, B, and C.

8. Exhibit A is the heated uncoated coupon in which significant areas of oxidized surface have spalled off.

9. Exhibit B is the heated Birchall coated coupon in which essentially all of the coating together with oxidized surface has spalled off.

10. Exhibit C is the heated coupon of Application No. 10/627,194 in which shows no significant spalling.

11. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above referenced application or any patent issuing thereon.

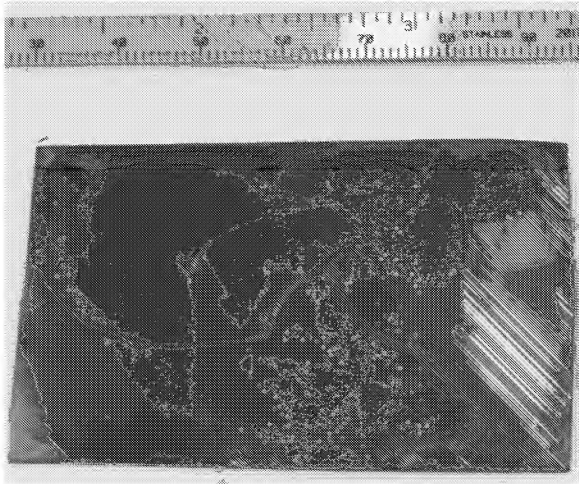


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VIKRAM S. KAUL

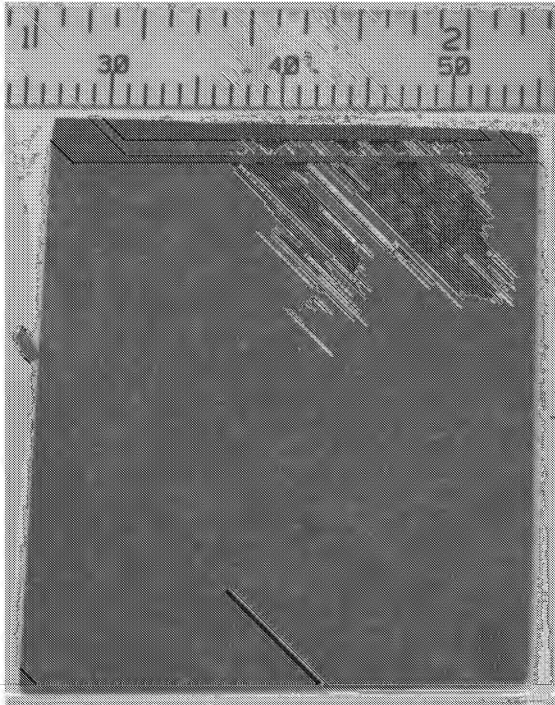
Date: \_\_\_\_\_ July 20, 2009\_

## Exhibit A



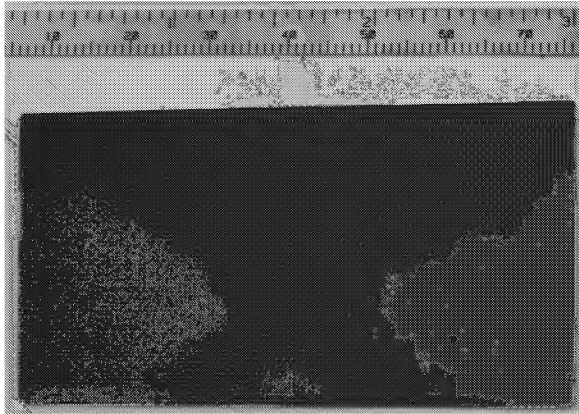
- Uncoated 304 stainless steel
- Oxidized in static ambient air at 1000 °C for 10 hours

## Exhibit B



- Birchall 304 stainless steel
- Oxidized in static ambient air at 1000 °C for 10 hours

## Exhibit C



- Application No. 10/627,194 304 stainless steel
- Oxidized in static ambient air at 1000 °C for 10 hours